

REMARKS

I. FORMAL MATTERS

Applicant notes with appreciation the Examiner's indication that claims 5, 7-9, 13, 15-17, 22 and 24-26 would be allowable if rewritten in independent form and to overcome the rejection under 35 U.S.C. § 112, second paragraph. Applicant submits that there is no rejection under 35 U.S.C. § 112, second paragraph.

Applicant notes with appreciation the Examiner's indication that the drawings filed on July 3, 2001 are acceptable.

Applicant notes with appreciation the Examiner's acknowledgement of the claim to foreign priority under 35 U.S.C. § 119(a)-(d) or (f) and indication that the certified copies of the priority documents have been received.

II. OBJECTION TO THE DRAWINGS

The Examiner asserts that Figures 8-10 should be labeled as "Prior Art" because only that which is old is illustrated. Applicant submits herewith a Submission of Corrected Formal Drawings for Figures 8-10 which labels these figures as Prior Art.

III. REJECTION UNDER 35 U.S.C. § 103(a)

Claims 1-4, 6, 10-12, 14, 18-21, 23 and 27-30 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the Conventional Art. This rejection is traversed.

The Examiner asserts that Fig. 8 and page 3, lines 2-5 of the Conventional Art teaches a common electrode signal generator circuit 50 that adjusts the DC level of the common electrode signal. The Examiner admits that the conventional art does not

teach or suggest shifting voltage levels of the source signals supplied by the source driver equally for all pixel electrodes. The Examiner asserts that it would have been obvious to modify variations in the drain voltage caused by the effects of the parasitic capacity of the TFT and adjust the DC level of each panel to achieve the function of shifting voltage levels of the source signals supplied by the source driver equally for all of the pixel electrodes because this would allow the DC level of the potential difference between the common electrode and the pixel electrode to be adjusted at an optimum value.

Applicant submits that the Examiner has failed to form a *prima facie* case of obviousness for several reasons. As admitted by the Examiner, the Conventional Art fails to teach or suggest to shift voltage levels of the source signals supplied by the source driver equally for all of the pixel electrodes. The Examiner has not cited a prior art reference that teaches this feature admittedly not taught by Conventional Art. Therefore, the Examiner has not formed a *prima facie* case of obviousness. In order to form a *prima facie* case of obviousness, the Examiner must cite prior art that teaches or suggests all of the claim features (see MPEP § 2143.03, *In re Royka*, 490 F.2d 981, 180 USPQ (580 CCPA 1974)). Thus, the rejection is improper and should be withdrawn.

Further, the Examiner has not properly shown a suggestion or motivation to so modify the conventional art. The Examiner merely asserts that the conventional art teaches that variations in the drain voltage caused by the effects of parasitic capacity of the TFT are erratic and contain irregularity that occur with each panel in manufacture. This merely states a problem that is experienced by the conventional art. It does not amount to a suggestion to modify the conventional art to form the present invention. Therefore, the Examiner also has failed to show a suggestion or motivation to so modify the conventional art, further demonstrating that the Examiner has failed to form a *prima facie* case of obviousness.

The conventional art does not appear to even remotely present any suggestion to shift voltage levels of source signals supplied by a source driver equally for all of pixel electrodes. In fact, the present invention achieves dramatically superior results over the conventional art, results which further demonstrate the non-obviousness of the present invention. For example, the conventional art requires a clamp circuit including a voltage adjusting resistor which results in increased power consumption. In the present invention, because the voltage levels of the source signals supplied by the source driver are shifted equally for all of pixel electrodes, the need for a clamp circuit with a voltage adjusting resistor is eliminated, thereby dramatically reducing power consumption and the complexity of the circuit. Also, the elimination of the clamp circuit makes it possible to use the drive circuit for low frequency drive and suspension drive (see page 10, line 12 through page 11, line 4 of the subject specification).

Fig. 8 illustrates a common electrode signal generator circuit 50 that adjusts a DC level (voltage level) of a common electrode signal. This circuit adjusts the DC level by varying a value of variable resistance of a clamp circuit 57. As a voltage difference between the common electrode signal and a pixel electrode, a DC level is adjusted to an optimum value in consideration of an amount of variation of a drain voltage on account of a parasitic capacity of the TFT.

In the driver circuit of the conventional liquid crystal display device shown in Figures 8-10, the adjustment of a common electrode signal is done by adopting a clamp circuit 57 to a common electrode signal generator circuit 50. The resistance and variable resistance of this clamp circuit 57 therefore always receive electrical power. Therefore, the power consumption of the clamp circuit.57 is high and this arrangement cannot be adopted to TFT's-LCD's for electronic devices such as mobile phones that require low power consumption.

Furthermore, in the conventional common electrode signal generator circuit 50 adopting the clamp circuit 57 and a capacitor, a stable DC level on the common electrode cannot be obtained without periodic conversions to AC, so that the circuit 50 cannot be used for low frequency drive and suspension drive , as discussed on page 3, lines 2-5 and 16-22; page 5, lines 9-18; and page 6, lines 14-21 of the subject specification.

In contrast, the present invention, as recited in claims 1, 12 and 21, can shift the overall DC levels while keeping the potential difference of the mean voltage of tone voltages using a “voltage level adjusting means for shifting voltage levels of the source signals supplied by the source driver equally for of the pixel electrodes.” Therefore, a clamp circuit with resistors for voltage adjustment, which is indispensable in the conventional apparatus, is not required, and the increased power consumption caused by the clamp circuit is eliminated. Furthermore, because the clamp circuit and the capacitor are no longer necessary, the driver circuit can be used for low frequency drive and suspension drive (see page 10, line 12 – page 11, line 4 of the subject specification).

As the Examiner admits, the conventional neither describes nor indicates “voltage levels for shifting voltage levels of the source signals supplied by the source driver equally for all the pixel electrodes,” and the Examiner does not cite any prior art documents that teach this feature.

Furthermore, the convention art performs the DC level adjustment for each panel merely because an amount of variation of a drain voltage on account of the parasitic capacity of the TFT is not constant between panels but different due to the variations caused in the manufacturing process. For this reason, the present invention would not have been obvious to one skilled in the art.

Therefore, Applicant submits that the present invention would not have been obvious over the conventional art because: (1) a conventionally indispensable clamp circuit is no longer required; (2) the possibilities of increased power consumption caused by the presence of the clamp circuit are eliminated; and (3) low frequency drive and suspension drive can be realized.


Therefore, for the foregoing reasons, Applicant submits that the rejection under 35 U.S.C. § 103(a) is improper and should be withdrawn.

If the Examiner believes that any issue can be resolved through a telephone interview, Applicant kindly requests the Examiner to contact the undersigned at the telephone number listed below.

Applicant believes that no additional fees are due for the subject application. However, if for any reason a fee is required, a fee paid is inadequate or credit is owed for any excess fee paid, you are hereby authorized and requested to charge Deposit Account No. **04-1105**.

Respectfully submitted,

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